



**U.S. Army  
Environmental  
Center**

## **SIERRA ARMY DEPOT Lassen County, California**

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**DRMO Trench Area**

**Final**

**Record of Decision/Remedial Action Plan**

**Contract DAAA15-90-D-0011**

**Task Order 3**

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**March 1998**



**MONTGOMERY WATSON**

**SIERRA ARMY DEPOT  
LASSEN COUNTY, CALIFORNIA**

**FINAL  
RECORD OF DECISION/REMEDIAL ACTION PLAN  
DRMO TRENCH AREA**

**CONTRACT DAAA15-90-D-0011  
TASK ORDER 3**

**Prepared for:**

**UNITED STATES ARMY  
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**March 1998**

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DRMO TRENCH AREA**

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RECORD OF DECISION/REMEDIAL ACTION PLAN  
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## ACRONYMS AND ABBREVIATIONS

APCD	Air Pollution Control District
ARAR	applicable or relevant and appropriate requirement
AVG	average
bgs	below ground surface
BNA	Base-Neutral and Acid Extractable Organics
BRA	baseline risk assessment
Cal-EPA	California Environmental Protection Agency
CCR	California Code of Regulations
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	compound of concern
DCB	Dichlorobenzene
DPDO	Defense Property Disposal Office
DRMO	Defense Reutilization and Marketing Office
DTSC	Department of Toxic Substances Control
EP	Extraction Procedure
ESE	Environmental Science and Engineering, Inc.
°F	Degrees Fahrenheit
FFSRA	Federal Facility Site Remediation Agreement
FS	Feasibility Study
GAC	granular activated carbon
GPR	Ground Penetrating Radar
HHRA	Human Health Risk Assessment
HI	hazard index
HQ	hazard quotient
HWM	hazardous waste management
JMM	James M. Montgomery, Consulting Engineers, Inc.
LUFT	Leaking Underground Fuel Tank
µg/dL	Micrograms per deciliter
µg/g	Micrograms per Gram
mg/kg	milligrams per kilogram
msl	mean sea level
NCP	National Contingency Plan
NPL	National Priorities List
OC	organochlorine
PAH	polycyclic aromatic hydrocarbons
PC	permeability constant
PCB	polychlorinated biphenyls
PWQO	Protective Water Quality Objective
RAP	remedial action plan
RfD	reference dose
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study

## **ACRONYMS AND ABBREVIATIONS**

**(Continued)**

RME	reasonable maximum exposure
ROD	record of decision
RWQCB	Regional Water Quality Control Board
SARA	Superfund Amendments and Reauthorization Act of 1986
SF	slope factor
SIAD	Sierra Army Depot
SVE	soil vapor extraction
SVOC	semivolatile organic compound
SWRCB	State Water Resources Control Board
TBC	to be considered
TCE	trichloroethene
TMV	toxicity, mobility, or volume
TPH	Total Petroleum Hydrocarbon
TPH-diesel	total petroleum hydrocarbons as diesel
TPH-gas	total petroleum hydrocarbons as gasoline
TRPH	Total Recoverable Petroleum Hydrocarbon
USAEC	U.S. Army Environmental Center
USAEHA	U.S. Army Environmental Hygiene Agency
USATHAMA	U.S. Army Toxic and Hazardous Materials Agency
USDI	U.S. Department of the Interior
USEPA	U.S. Environmental Protection Agency
VOC	volatile organic compound
WDR	waste discharge requirements

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## **1.0 DECLARATION**

### **1.1 SITE NAME AND LOCATION**

Defense Reutilization and Marketing Office Trench Area, Sierra Army Depot, Lassen County, California.

### **1.2 STATEMENT OF BASIS AND PURPOSE**

This Record of Decision (ROD)/Remedial Action Plan (RAP) presents, for the Defense Reutilization and Marketing Office (DRMO) Trench Area, the selected response actions that were chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments Reauthorization Act of 1986 (SARA), to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), and Chapter 6.8 of the California Health and Safety Code. Further, these actions are also being taken in response to the California Water Code. This ROD/RAP explains the factual and legal basis for selecting the response actions for the DRMO Trench Area. The information supporting the selected response actions is contained in the Administrative Record for this site. The State of California, as represented by the Department of Toxic Substances Control (DTSC) and the Lahontan Regional Water Quality Control Board (RWQCB), concur with the response actions selected by the U.S. Army (Army).

Section 25356.1(e) of the California Health and Safety Code requires that a RAP approved by DTSC include a non-binding preliminary allocation of financial responsibility among all identifiable potentially responsible parties. Upon consideration of all the evidence, DTSC has concluded that the preliminary non-binding allocation of financial responsibility in this ROD/RAP is as follows:

- U.S. Army, Sierra Army Depot: 100 percent

The content of this ROD/RAP is based on recommendations in the U.S. Environmental Protection Agency's (USEPA's) Interim Final Guidance on Preparing Superfund Decision Documents (USEPA, 1989a).

### **1.3 ASSESSMENT OF THE SITE**

The DRMO Trench Area consists of three source areas of contamination: the DRMO Open Trench, the Burn and Debris Area, and the Active DRMO Yard. The activities conducted at the DRMO Open Trench and Burn and Debris Area have ceased while the Active DRMO Yard continues to be used for the management, storage, and salvage of surplus materials.

#### **1.3.1 DRMO Open Trench Soil**

The DRMO Open Trench is a former disposal trench approximately 290 feet long, 40 feet wide, and 10 feet deep. The trench was reportedly used extensively from 1942 to 1973 and in a limited

capacity from 1973 to 1987 for disposal of waste oils, oil sludge, solvents, and cleaning fluids from vehicle maintenance activities. Laboratory analyses indicate that the soil at the DRMO Open Trench is contaminated with volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides, metals, total petroleum hydrocarbons as gasoline (TPH-gas) and TPH as diesel (TPH-diesel). SVOC and VOC contamination extends from ground surface to the soil/groundwater interface (approximately 100 feet below ground surface) beneath portions of the open trench.

### **1.3.2 Burn and Debris Area Soil**

The Burn and Debris Area is an area, approximately 175 feet by 55 feet, containing a surficial layer of debris from burning activities. VOCs, polychlorinated biphenyls (PCBs), dioxin/furans, and metals have been detected in surface and near-surface soil at the Burn and Debris Area. The chemicals detected in the Burn and Debris Area have not impacted groundwater beneath the site due to the low mobility of the compounds and the absence of a driving force to move the chemicals.

### **1.3.3 Active DRMO Yard Soil**

The Active DRMO Yard is a fenced area, approximately 550 feet wide by 1,600 feet long, east of the open trench. This area is used for the storage of surplus and scrap materials that can be reutilized or sold by the Army. Pesticides, PCBs, metals, and petroleum hydrocarbons have been detected in surface and subsurface soil within the Active DRMO Yard. The Active DRMO Yard is also a potential source of VOCs in groundwater beneath the site. Discrete VOC sources were not identified during the 1993 Group I and II Follow-Up RI. However, elevated levels of trichloroethene (TCE) were detected in soil gas at the Active DRMO Yard.

### **1.3.4 Groundwater**

Groundwater has been characterized beneath all three of the source areas at the DRMO Trench Area. The TCE detected in the monitoring well and HydroPunch groundwater samples collected in the vicinity of the open trench is interpreted to be a result of the soil contamination in the open trench. The origin of the TCE detected in the groundwater samples collected from beneath the Active DRMO Yard is uncertain but may be due to unidentified source(s) located in the active yard.

SVOCs were detected in one HydroPunch groundwater sample collected directly beneath the open trench. The SVOCs are interpreted to be a result of migration of these compounds through the vadose zone. Based on the chemical properties of the SVOCs and their concentrations, they are not expected to migrate at a significant rate.

## **1.4 DESCRIPTIONS OF THE SELECTED REMEDIES**

### **1.4.1 DRMO Open Trench Soil**

The selected remedy will utilize soil vapor extraction (SVE) and bioventing to address the contaminated soil at the DRMO Open Trench by reducing concentrations of VOCs, SVOCs, and petroleum hydrocarbons in soil. SVE treats the soil in situ using vacuum extraction vents. Air flow through the soil to the extraction vents removes volatile constituents from the soil. The extracted vapors will be treated using granular activated carbon (GAC) to remove VOCs from the extracted vapors and prevent discharge of constituents to the air. Once solvent and SVOC concentrations in the extracted vapors reach minimum levels, the SVE system would be converted to an in situ bioventing system by reversing the direction of air flow. Bioventing would utilize air injection to stimulate naturally occurring aerobic bacteria that biodegrade those chemical constituents not removed via SVE.

The zone of soil contamination in the open trench that requires remediation is estimated to be from the bottom of the trench to 15 feet below the bottom of the trench. Prior to SVE/bioventing treatment, the selected remedy involves backfilling approximately 10 feet of imported clean soil into the trench. Backfilling will prevent rapid air exchange between the extraction/injection system and the atmosphere. It will also enable SVE/bioventing to treat the entire volume of soil from the bottom of the trench to 15 feet below the bottom of the trench, without having to excavate and remove any soil.

The selected remedy for the DRMO Open Trench soil is described in more detail in Sections 2.7, 2.8, 2.9, and 2.10.

### **1.4.2 Burn and Debris Area Soil**

The selected remedy will utilize excavation and off-site disposal to address the contaminated soil at the Burn and Debris Area by reducing concentrations of VOCs, PCBs, dioxin/furans, and metals in soil. It is assumed that approximately 700 cubic yards (1,100 tons) of soil from the Burn and Debris Area will be excavated and transported to a commercial off-site facility for treatment and disposal. Given the levels of copper and lead detected in the soils, it is assumed that the soil would require treatment for metals stabilization prior to disposal in an appropriate land disposal facility. Additional characterization of the extent of contaminated soil prior to or during removal of the soil may reduce the volume to be excavated as well as the cost. The site would be backfilled with clean soil where necessary to promote runoff of surface water.

The selected remedy for the Burn and Debris Area soils is described in more detail in Sections 2.7, 2.8, 2.9, and 2.10.

### **1.4.3 DRMO Trench Area Groundwater**

The selected remedy will address the contaminated groundwater at the DRMO Trench Area by utilizing attenuation processes that occur naturally within the aquifer to decrease chemical

concentrations and reduce migration of TCE to rates that are acceptable to the State of California. The site-specific hydrogeologic conditions (i.e., flat hydraulic gradients and low hydraulic conductivities) are highly favorable for use of natural attenuation at the DRMO Trench Area. The major components of the selected remedy are:

- Source removal via SVE/bioventing treatment of DRMO open trench soils (as described in Section 1.4.1)
- Installation of additional monitoring wells to complete the groundwater monitoring network
- Evaluation of natural attenuation of TCE in groundwater
- Source removal of soil gas hot spot at the DRMO Active Yard via SVE treatment

Groundwater monitoring of selected wells will be performed to evaluate attenuation and degradation of the TCE plume. Groundwater sampling will be conducted quarterly for one year, then annually thereafter. The Army will submit status reports on the results of groundwater monitoring to the State of California. Groundwater modeling may also be conducted, if warranted. Institutional controls would be utilized to restrict the use of groundwater at the site during long-term monitoring.

In the future, if the selected remedy is no longer acceptable to the State of California or the Army, a contingency alternative will be implemented. However, if the Army and the State do not agree with each other, either the State or the Army can invoke dispute resolution via Section 12 of the Federal Facility Site Remediation Agreement (FFSRA). The contingency alternative consists of groundwater extraction and treatment; treated groundwater would be disposed of by reinjection or by another method that is acceptable to the State.

The selected remedy also includes remediation of soil within a localized area of the Active DRMO Yard where elevated levels of TCE in soil gas were detected. An SVE system would be constructed to remediate possible TCE in soil within the area of a soil gas anomaly. The soil remediation would eliminate the possibility that the elevated soil gas levels represent a point source for TCE in groundwater beneath the site.

The selected remedy for the DRMO Trench Area groundwater is described in more detail in Sections 2.7, 2.8, 2.9, and 2.10.

## **1.5 STATUTORY DETERMINATIONS**

### **1.5.1 DRMO Open Trench Soil**

The selected remedy for the DRMO Open Trench soil satisfies the statutory requirements of CERCLA §121 and §120(a)(4), as amended by SARA, in that the following mandates are attained:

- The selected remedy is protective of human health and the environment.
- The selected remedy complies with federal and state requirements that are legally applicable or relevant and appropriate to the remedial action.
- The selected remedy is cost effective.
- The selected remedy utilizes permanent solutions and alternative treatment technologies or resource recovery technologies, to the maximum extent practicable.
- The selected remedy satisfies the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element.

### **1.5.2 Burn and Debris Area Soil**

The selected remedy for the Burn and Debris Area soil satisfies the statutory requirements of CERCLA §121 and §120(a)(4), as amended by SARA, in that the following mandates are attained:

- The selected remedy is protective of human health and the environment.
- The selected remedy complies with federal and state requirements that are legally applicable or relevant and appropriate to the remedial action.
- The selected remedy is cost effective.
- The selected remedy utilizes permanent solutions and alternative treatment technologies or resource recovery technologies, to the maximum extent practicable.
- The selected remedy satisfies the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element.

### **1.5.3 DRMO Trench Area Groundwater**

The selected remedy with the contingency alternative for the DRMO Trench Area groundwater satisfies the statutory requirements of CERCLA §121 and §120(a)(4), as amended by SARA, in that the following mandates are attained:

- The selected remedy with the contingency alternative is protective of human health and the environment.

- The selected remedy with the contingency alternative complies with federal and state requirements that are legally applicable or relevant and appropriate to the remedial action.
- The selected remedy with the contingency alternative is cost effective.
- The selected remedy with the contingency alternative utilizes permanent solutions and alternative treatment technologies or resource recovery technologies, to the maximum extent practicable.
- The selected remedy with the contingency alternative satisfies the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element.

Because the selected remedy will result in contaminants remaining on site above the target cleanup levels during the remedial actions, 5-year site reviews will apply to these actions [CERCLA § 121(c) and 40 CFR 300.430 (f)(4)(ii)].